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TITLE OF THE INVENTION

INFORMATION PROCESSING APPARATUS, POWER SUPPLY CONTROL

METHOD FOR SAME, AND POWER SUPPLY CONTROL PROGRAM

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BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an information

10 processing apparatus, a power supply control method for

the same, and a power supply control program.

Description of the Related Art

Conventionally, a power supply control technique

15 for an image forming apparatus has been known in which

the power status of the image forming apparatus is

monitored at a remote location, and the turning-on/off

of power supply to the image forming apparatus is

remotely controlled.

20 Also, a power supply control technique has been

known in which the turning-on/off of power supply only

to a designated local part of an image forming

apparatus (refer to Japanese Laid-Open Patent

Publication (Kokai) No. 6-183102, for example).

25 On the other hand, a so-called multifunction

digital copying machine has been known as an image

forming apparatus for inputting/outputting images. The

multifunction digital copying machine is comprised

mainly of a scanner which reads an original image

recorded on e.g. a sheet, a printer which outputs the

read image or an image transmitted from a host computer

5   to a medium such as a sheet, a device controller which

controls the operations of the scanner and the printer

or performs various kinds of image processing, an

operating section through which the user can operate

the machine, and a memory and a hard disk which

10   temporarily or permanently store image data, processing

programs, and so forth.

    The multifunction digital copying machine

constructed as described above is capable of not only

copying an original image but also transferring image

15   data read by the scanner to the host computer via a LAN

(network) and, on the other hand, causing the printer

to print out documents prepared on the host computer

using a word processor or the like. Further, as is

known, the multifunction digital copying machine has a

20   variety of functions such as a facsimile function of

transmitting an original image to a facsimile apparatus

at a remote location.

    According to the conventional techniques, however,

although instructions for turning-on/off power supply

25   to the image forming apparatus can be given from a

remote location, such instructions are only related to

turning-on/off of power supply to the image forming

apparatus as a whole, and hence power supply cannot be controlled in a manner satisfying user's needs.

For example, the multifunction digital copying machine has the problem that even when it is desired to use only a printing function, power is supplied for not only the printing function but also the facsimile function in response to an instruction for turning on power supply.

Further, when power supply for the printing function is desired to be turned off, power supply for not only the printing function but also the facsimile function is turned off, and hence it is necessary to turn on power supply again when using the facsimile function.

Further, due to complicated functions of the multifunction digital copying machine, the user is required to carry out such a complicated operation as designating as to which part is to be subjected to power supply control to carry out turning on/off of power supply in a manner satisfying his/her needs.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an information processing apparatus, a power supply control method for the same and a power supply control program that make it possible to supply power

only for functions desired by the user.

    To attain the above object, in a first aspect of the present invention, there is provided an information processing apparatus having a plurality of functions,

5   comprising a display unit, a display control unit that causes the display unit to display the plurality of functions in a manner being selectable, an input unit that inputs information on at least one function selected from the plurality of functions via a screen

10   displayed by the display unit, and a power supply control unit that controls power supply relating to the at least one function input via the input unit, based on the information on the at least one function.

    According to the first aspect of the present

15   invention, the user can carry out control of power supply only for his/her desired function without hesitation, and does not have to carry out such complicated operations as determining a device or devices which correspond to his/her desired function

20   and bringing the device or devices into an ON/OFF/sleep state.

    Preferably, the display control unit controls the display unit to display types of power supply control corresponding to the at least one function on the

25   screen in a manner being selectable, and the power supply control unit controls the power supply based on the information on the at least one function input via

the input unit and information on the types of power

supply control corresponding to the at least one

function.

Preferably, the information processing apparatus

5   comprises a plurality of units relating to execution of

the plurality of functions, and wherein the power

supply control unit controls power supply to at least

one unit of the plurality of units which is required

for execution of the at least one function input via

10   the input unit.

Preferably, the display control unit controls the

display unit to display a change in status of power

supply corresponding to the at least one function on

the screen.

15   Preferably, the information processing apparatus

comprises a communication control unit that carries out

communication with an external unit via a network.

With this preferable arrangement, it is possible

to control power supply and indicate the status thereof

20   for each function via a network and more particularly

on the Web.

Preferably, the information processing apparatus

is implemented by an image processing apparatus having

image forming unit for forming an image.

25   Preferably, the plurality of functions comprise at

least two functions selected from the group consisting

of a printing function, a facsimile function, a copying

function, and a scanner function.

To attain the above object, in a second aspect of the present invention, there is provided a power supply control method for an information processing apparatus

5   including a display unit and having a plurality of functions, comprising a display control step of causing the display unit to display the plurality of functions in a manner being selectable, an input step of inputting information on at least one function selected

10   from the plurality of functions via a screen displayed by the display unit, and a power supply control step of controlling power supply relating to the at least one function input in the input step, based on the information on the at least one function.

15   Preferably, the display control step comprises controlling the display unit to display types of power supply control corresponding to the at least one function on the screen in a manner being selectable, and the power supply control step comprises controlling

20   the power supply based on the information on the at least one function input in the input step and information on the types of power supply control corresponding to the at least one function.

Preferably, the information processing apparatus

25   comprises a plurality of units relating to execution of the plurality of functions, and the power supply control step comprises controlling power supply to at

least one unit of the plurality of units which is required for execution of the at least one function input in the input step.

Preferably, the display control step comprises controlling the display unit to display a change in status of power supply corresponding to the at least one function on the screen.

Preferably, the power supply control method comprises a communication control step of carrying out communication with an external unit via a network.

Preferably, the information processing apparatus is implemented by an image processing apparatus having image forming unit for forming an image.

Preferably, the plurality of functions comprise at least two functions selected from the group consisting of a printing function, a facsimile function, a copying function, and a scanner function.

To attain the above object, in a third aspect of the present invention, there is provided a power supply control program for causing a computer to execute a power supply control method for an information processing apparatus including a display unit and having a plurality of functions, comprising a display control module for causing the display unit to display the plurality of functions in a manner being selectable, an input module for inputting information on at least one function selected from the plurality of functions

via a screen displayed by the display unit, and a power

supply control module for controlling relating to the

at least one function input by the input module, based

on the information on the at least one function.

5   The above and other objects, features, and

advantages of the invention will become more apparent

from the following detailed description taken in

conjunction with the accompanying drawings.

10   BRIEF DESCRIPTION OF THE DRAWINGS

      FIG. 1 is a diagram showing the arrangement of a

remote control system incorporating an information

processing apparatus according to a first embodiment of

15   the present invention;

      FIG. 2 is a block diagram showing the arrangement

of a multifunction digital copying machine (MFP) 200

appearing in FIG. 1;

      FIG. 3 is a sectional view showing the

20   construction of the MFP 200;

      FIG. 4 is a flow chart showing the procedure of a

power supply control process carried out by the MFP 200

as a Web server;

      FIG. 5 is a view showing a window screen for

25   controlling power supply;

      FIG. 6 is a view showing a window screen of the

MFP 200 for which power supply has been turned off;

FIG. 7 is a view showing a window screen displayed when a device button 403 is selected;

FIG. 8 is a view showing a window screen when a power-on button 603 is selected;

FIG. 9 is a view showing a window screen displayed when all devices have been completely started;

FIG. 10 is a view showing a window screen displayed when the devices are in sleep states;

FIG. 11 is a view showing a window screen displayed when the device button 403 is selected;

FIG. 12 is a view showing a window screen displayed when a sleep release button 605 is selected;

FIG. 13 is a view showing a window screen displayed when a timer setting button 606 is selected;

FIG. 14 is a view showing a window screen for setting time by a minute setting section 1508;

FIG. 15 is a view showing a window screen displayed when a desired period of time is selected from a menu;

FIG. 16 is a view showing a window screen displayed when an execution button 1509 is depressed;

FIG. 17 is a view showing a window screen displayed when all the devices have been completely started;

FIG. 18 is a view showing a window screen for changing a display mode;

FIG. 19 is a view showing a window screen

displayed when a function display button 1803 is selected;

FIG. 20 is a view showing a window screen for controlling power supply for each function;

5　　　FIG. 21 is a view showing a window screen displayed in response to an instruction for controlling power supply for a printing function;

FIG. 22 is a view showing a window screen displayed when power supply for the printing function

10　is turned on;

FIG. 23 is a view showing a window screen displayed in response to an instruction for controlling power supply for a copying function;

FIG. 24 is a view showing a window screen

15　displayed when the power supply for the copying function is turned on; and

FIG. 25 is a flow chart showing the procedure of a power supply control process carried out by the MFP 200 as a Web server according to a third embodiment of the

20　present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will now be described in

25　detail with reference to the drawings showing preferred embodiments thereof. In the drawings, elements and parts which are identical throughout the views are

designated by identical reference numerals, and
duplicate description thereof is omitted.

FIG. 1 is a diagram showing the arrangement of a
remote control system incorporating an information
processing apparatus according to a first embodiment of
the present invention. In FIG. 1, reference numeral
101 denotes a communication network such as the
Internet; 102, a support center for providing support
for hardware and software; 103, a hardware/software
shop; 104, a Web server that is connected to the
Internet to provide specific services for Internet
users; 105, an electronic money server that deals with
e.g. settlement between a banking institution 106 and
clients (terminal apparatuses); and 107, a service
provider that connects personal user's terminal
apparatuses and the Internet 101 to each other.

It should be noted that clients as terminal
apparatuses are implemented by personal computers 112,
and are each comprised of a CPU (Central Processing
Unit), non-volatile storage such as a RAM and a hard
disk, an input/output section for inputting/outputting
information to and from a variety of peripheral devices
such as a display, a keyboard, and a mouse, and a
communication section such as a modem, all of which are
provided in an ordinary information processing
apparatus. The personal computers 112 constructed as
above perform processing according to flow charts

described later and control the display of screens.

Reference numeral 108 denotes a firewall that connects the Internet 101 as an external communication network to a LAN 121, and carries out security

5 management, for example. Reference numeral 109 denotes a device management server that manages a file server 110, a mail server 111, the personal computers (PCs) 112, a printer 113, and so forth connected to the LAN (network) 121, and manages users and data such as

10 accounting information. The file server 110 carries out data management, for example, and outputs data to a multifunction digital copying machine 200 or the printer 113 as the need arises.

FIG. 2 is a block diagram showing the arrangement

15 of the multifunction digital copying machine 200 as the information processing apparatus. The multifunction digital copying machine 200 (hereinafter referred to as "the MFP") 200 is comprised mainly of a scanner 202 which reads an original image recorded on e.g. a sheet,

20 a printer 203 which outputs the read image or an image received via the LAN 121 to a medium such as a sheet, a facsimile 209 which transmits an image to an external terminal apparatus, a device controller 204 which controls the operations of the scanner 202, printer 203,

25 and facsimile 209 or performs various kinds of image processing, an operating section 201 for inputting instructions for operations of the devices, and a

memory 205 and a hard disk 206 which temporarily or

permanently store image data and processing programs.

The device controller 204 is comprised of a CPU 207

which executes programs stored in the memory 205 and

5 the hard disk 206, and a communication control section

208 which controls communication between the devices

201 to 206 and 209, the LAN 121, and the CPU 207.

Further, the MFP 200 includes a power supply section

210 which is connected to the device controller 204 and

10 supplies power to the devices 201 to 209. Since the

Internet is now widely used, the MFP 200 is connected

not only to a specific network (LAN) but also to other

networks around the world via the firewall 108. Namely,

the MFP 200 can be managed and controlled not only via

15 a specific network but also from terminal apparatuses

and others connected to networks around the world. In

the MFP 200, a copying function is realized by a

combination of the scanner 202 and the printer 203.

FIG. 3 is a sectional view showing the

20 construction of the MFP 200. The MFP 200 is comprised

of a reader section 220 and a printer section 230. In

the reader section 220, an original feeder 301

sequentially feeds originals sheet by sheet from the

last page onto a platen glass 302, and discharges each

25 original on the platen glass 302 after the original is

read. When each original is conveyed onto the platen

glass 302, a lamp 303 is turned on, and a scanner unit

304 is caused to start moving to scan the original back and forth.

On this occasion, light reflected from the original is guided to a CCD image sensor (hereinafter

5 referred to as "the CCD") 309 by optical elements such as mirrors 305, 306, and 307 and a lens 308. An image on the original thus scanned is read by the CCD 309. The CCD 309 outputs image data, which is then subjected to predetermined processing and transferred to the

10 printer section 230.

A laser driver 310 of the printer section 230 drives a laser emitter 311 to emit laser light corresponding to the image data output from the reader section 220. The laser light is irradiated upon a

15 photosensitive drum 312, so that a latent image corresponding to the laser light is formed on the photosensitive drum 312. A developing agent is attached to the latent image on the photosensitive drum 312 by a developing unit 313. Then, in timing

20 synchronous with the start of laser light irradiation, a recording sheet is fed from a cassette 314 or 315 and conveyed to a transfer section 316, and the developing agent attached to the photosensitive drum 312 is transferred onto the recording sheet.

25 The recording sheet with the developing agent attached thereto is conveyed to a fixing section 317, so that the developing agent is fixed on the recording

sheet due to heat and pressure applied by the fixing section 317. After passing through the fixing section 317, the recording sheet is discharged by a pair of discharging rollers 318. In the case where a sorting

5 mode is not set, a sorter 321 stores the recording sheet on a top pin 322. On the other hand, in the case where a double-sided recording mode is set, the recording sheet is conveyed to the discharging rollers 318, and then the rotational directions of the

10 discharging rollers 318 are reversed, so that the recording sheet is guided to a sheet refeed conveying path 320 by a flapper 319. In the case where a multiple recording mode is set, the recording sheet is guided to the sheet refeed conveying path 320 by the

15 flapper 319, while the recording sheet is not conveyed to the discharging rollers 318. The recording sheet conveyed to the sheet refeed conveying path 320 is fed to the transfer section 316 in the above described timing.

20 The MFP 200 constructed as described above is operated by the user through the operating section 201, and the scanner 202 of the MFP 200 receives images in accordance with instructions given from the operating section 201 and the personal computers 112. The

25 printer 113 prints data received from the personal computers 112 and the file server 110.

The device controller 204 controls the

input/output of image data to/from the scanner 202, printer 203, memory 205, hard disk 206, or personal computer 112 in accordance with instructions input from the operating section 201 or the personal computer 112.

5 For example, the device controller 204 provides control to store image data, which is captured from the scanner 202, in the memory 205 or the hard disk 206 as the need arises, output the data to the personal computer 112, or cause the printer 203 to print the data.

10 The printer 113 prints image data, which is supplied from the personal computer 112 or the file server 110, on a recording sheet. The personal computer 112 as a terminal apparatus is connected to the LAN 121, and refers to information supplied from

15 the Web server 104 via the Internet 101, and outputs image data to the MFP 200 and the printer 113. It should be noted that the personal computer 112 is connected to the Internet 101 via the firewall 108, but may be connected to the Internet 101 via the service

20 provider 107.

To remotely control the MFP 200 via a network in the above described environment, it can be envisaged that a special line or a telephone line is used, but in the present embodiment, the Internet is used. As

25 described above, the MFP 200 is connected to the LAN 121 and has an IP (Internet Protocol) address. The MFP 200 is used as a web server to execute a script

language or the like so that the device management server 109 and the personal computers 112 can access the MFP 200 using a web browsing tool. Here, examples of the script language include JavaScript (registered

5   trademark) developed by Sun Microsystems, Inc. Examples of the Web browsing tool include Internet Explorer (registered trademark) developed by Microsoft Corporation and Netscape Navigator (registered trademark) developed by Netscape Communications

10   Corporation.

By using the Web browsing tool, the MFP 200 can be remotely controlled without depending on a platform. For example, the MFP can be controlled from terminal apparatuses whichever of Windows (registered trademark)

15   developed by Microsoft Corporation, Mac OS (registered trademark) developed by Apple Computer Inc., and Unix (registered trademark) the terminal apparatuses operate on. Specifically, by thus enabling remote control of the MFP 200 irrespective of the platform, the MFP 200

20   can be set or reset on a browsing screen, described later, not only from the specific device management server 109 but also from all the computers (terminals) on the LAN 121.

In the following description, it is assumed that

25   the MFP is based on the electrophotographic process, but it goes without saying that the information processing apparatus according to the present invention

may be applied to an MFP having an image forming section based on the ink-jet printing process, an electrophotographic printer having a plurality of predetermined functions, a facsimile machine, a copying

5   machine, or the like, for example.

Further, the information processing apparatus according to the present invention may be also applied to a single function machine that has any of a printer function, a facsimile function, and a copy function and

10   is connected to a network such that it may communicate with the network. In this case, each of devices constituting an MFP and corresponding to each function, described later, corresponds to the apparatus having each function.

15   FIG. 4 is a flow chart showing the procedure of a power supply control process carried out by one of the MFPs 200 serving as a Web server. A program for carrying out this process is stored in the hard disk 206 of the MFP 200 and is read out and executed by the

20   CPU 207 of the device controller 204 via the communication control section 208. It should be noted that the communication control section 208 included in the device controller 204 has a function of sending and receiving markup languages such as HTML and XML

25   conforming to Hyper Text Transfer Protocol. In the following description, it is assumed that HTML is used, but it goes without saying that a variety of markup

languages such as XML may be used.

First, a request to view a window screen is awaited, which is made by any terminal apparatus such as the PC 112 connected to the LAN 121 (step S1). In response to the request, the power statuses of the respective devices (respective blocks in FIG. 2) in the MFP 200 are detected, and information on a window screen file in HTML is generated based on the detected power statuses, and the window screen file is transmitted to the terminal apparatus having made the request (step S2). It should be noted that in the step S2, the power statuses can be detected each time a viewing request is made by a terminal apparatus, or information indicative of the detected power statues is stored in the memory 205 or the hard disk 206 in predetermined timing so that the CPU 207 can read out the stored information in response to a viewing request from a terminal apparatus. Here, the power statuses may be detected based on values detected by predetermined sensors, not shown, or may be detected by checking a history of power supply control commands stored in the memory 205 or the hard disk 206 by the CPU 207 when the CPU 207 gives power supply control commands to the respective devices.

Then, it is determined whether or not a request for change on a window screen (for example, a request to turn on power supply as shown in FIG. 16) has been

made by the terminal apparatus (client) or not (step

S3). If the request for change has not been made, the

process returns to the step S1. It should be noted

that in the present embodiment, the window screen means

5   a setting screen for making various settings including

at least an instruction for controlling power supply to

the MFP 200.

On the other hand, if the request for change has

been made, processing is performed in accordance with

10   the request (step S4). For example, as shown in FIG.

16, devices of the MFP 200 are started, and a status

display section 704 is caused to indicate that the

respective devices are being started. Then, the window

screen file is changed, and the changed file is then

15   transmitted to the terminal apparatus (step S5). The

process then returns to the step S1.

A description will now be given of how the

turning-on/off of power supply is controlled via a

network. FIG. 5 is a view showing a window screen for

20   controlling power supply. The MFP 200 connected to the

LAN 121 can be controlled through the operation of this

screen. Window screens shown in FIGS. 5 to 24 are

described in HTML (Hyper Text Markup Language), for

example.

25   Further, HTML information for displaying any of

screens shown in FIGS. 5 to 24 on the display of a

terminal apparatus via a browser is stored in advance

in the memory 205 or the hard disk 206 of the MFP 200, or is generated by the MFP 200 in response to each request from a terminal apparatus. At a terminal apparatus having made a request, an appropriate one of the screens shown in FIGS. 5 to 24 is displayed in accordance with the HTML information received from the MFP 200.

On the window screen in FIG. 5, for example, a name 401 and a location 402 of a device to be controlled are displayed. Further, a variety of buttons 403 to 407 are provided to enable function setting and job management. The device button 403 is used for checking the operative status of the device and controlling the device. The job button 404 is used for viewing a history of print jobs, copy jobs, or facsimile jobs. The box button 405 is used for viewing and managing user's data stored in the hard disk 206 of the MFP 200. As the need arises, the user prints the data or transmits the data by facsimile, or transmits the data to another MFP, computer, or the like. The address button 406 is used for transmitting the scanned image, and setting/registering e.g. a destination of the scanned image to be transmitted by facsimile. The specification setting button 407 is used for making basic setting, network setting, sending/receiving setting, etc. of the MFP.

On a main window, a last update time 408 and a

device operative status 409 are usually displayed. During normal operation, the operative statuses of the printer, scanner, facsimile, and copier are displayed as shown in FIG. 5. In this way, the operative status

5 of the MFP 200 can be checked on the Web even at a remote location.

FIG. 6 is a view showing a window screen of the MFP 200 when power supply is off. The status of the powered-off MFP 200 can be viewed on the Web. In FIG.

10 6, the facsimile function (facsimile 209) is in the sleep state and ready to receive data, but the other devices are off. In this state, the MFP 200 is powered on in accordance with an instruction from a terminal apparatus on the Web so that the MFP can be used. ·

15 FIG. 7 is a view showing a window screen displayed when the device button 403 is selected. When the device button 403 is selected, it is highlighted, and a variety of device settings are displayed. Specifically, a power-off button 602, a power-on button 603, a sleep

20 button 604, a sleep release button 605, and a timer setting button 606 are displayed. Although in the present embodiment, the turning-on/off of power supply and the setting/release of the sleep state are indicated as the device settings, the present invention

25 is not limited to this. To start the powered-off MFP 200, the power-on button 603 is selected.

FIG. 8 is a view showing a window screen displayed

when the power-on button 603 is selected. The selected

power-on button 603 has its character part bold-faced

or is indicated in colored characters, whereby the

selection thereof is indicated to instruct the MFP 200

5   to start operation, and whether the MFP 200 has started

operation or not is displayed. On this occasion, in

the status display section 704, a period of time

required to start the MFP 200 is displayed and counted

down. For example, to correct for the starting time

10   period varying with the environment where the MFP 200

is installed, the period of time is updated at

predetermined time intervals, and the updated period of

time is displayed. FIG. 9 is a view showing a window

screen displayed when the devices have been completely

15   started. When the devices have been completely started,

it is indicated that the devices have been started. In

FIG. 9, messages indicating that the devices have been

started are displayed as designated by reference

numeral 801, and a message "Started" is displayed in a

20   status display section 802.

A description will now be given of how the MFP 200

is started from a sleep state. The status of the MFP

200 in the sleep state can be viewed on the Web. FIG.

10 is a view showing a window screen displayed when the

25   devices are in the sleep state. The sleep state of

each device is released in accordance with an

instruction given from a terminal apparatus on the Web

so that the device can be used.

FIG. 11 is a view showing a window screen displayed when the device button 403 is selected. When the device button 403 is selected, it is highlighted, and a variety of device settings are displayed. To start the sleeping MFP 200, the sleep release button 605 is selected.

FIG. 12 is a view showing a window screen displayed when the sleep release button 605 is selected. The selected sleep release button 605 has its character part bold-faced or is indicated in colored characters, whereby the selection of the sleep release button 605 is indicated to instruct the MFP 200 to be released from the sleep state, and whether the MFP 200 has started operation or not is indicated. On this occasion, in a status display section 1104, a starting time period required to start the MFP 200 is displayed and counted down. For example, to correct for the starting time period varying with the environment where the MFP 200 is installed, the starting time period is updated at predetermined time intervals, and the updated period of start-up time is displayed. When the devices have been completely started, the same screen as in FIG. 9 is displayed to indicate that the devices have been started.

As described above, according to the present embodiment, since the turning-on/off of power supply

and the setting/release of the sleep state are controlled and the status thereof is displayed via a network and more particularly on the Web, the user can control the MFP even at a remote location. As a result,

5 the devices can be kept off or in the sleep state for a period of time for which power supply is not required, and this contributes to energy-saving. Further, since copying or the like can be performed according to the operative status of the MFP with reference to a period

10 of time displayed on the Web, the user does not have to waste time by standing in front of the MFP until the MFP is started. This is particularly advantageous in the case where the MFP is installed in a large office and at a location remote from the user or on a floor

15 other than the floor where the user is working.

Although in the above described embodiment, it is assumed that the MFP performs digital processing, this is not limitative, but an MFP which performs analog processing may be controlled in a manner similar to

20 that described above insofar as it is equipped with a device controller having a network interface.

A description will now be given of a second embodiment of the present invention with reference to FIGS. 13 to 17 as well as FIGS. 10 to 12, referred to

25 above.

The second embodiment is applied to a remote control system which is capable of performing on/off

control of power supply, timer setting for setting/release of the sleep state, and display of the set period of time. The arrangement of the remote control system according to the present embodiment is

5 identical with that of the above described first embodiment, and hence description thereof is omitted. Also, parts and elements corresponding to those of the first embodiment are designated by identical reference numerals, and hence description thereof is omitted.

10 The operative status of the sleeping MFP 200 can be viewed on the Web as shown in FIG. 10. It is possible to set the timer to release the MFP 200 from the sleep state at a desired time.

When the device button 403 is depressed, it is

15 highlighted, and a sub menu is displayed (refer to FIG. 11). When the timer setting button 606 is selected from the sub menu, it is possible to set time. FIG. 13 is a view showing a window screen displayed when the timer setting button 606 is selected. By selecting a

20 radio button 1503, it is possible to start the MFP at a desired time. In this case, "Time" is set in a time setting section 1504, and "Minute" is set in a minute setting section 1505. Then, when an execution button 1509 is selected to be depressed, data on "Time" set in

25 the time setting section 1504 and data on "Minute" set in the minute setting section 1505 are transmitted to the MFP 200.

The selection of a radio button 1506 specifies how minutes later the MFP 200 will be started. In this case, "Time" is set in a time setting section 1507, and "Minute" is set in a minute setting section 1508. When the execution button 1509 is selected to be depressed, data on "Time" set in the time setting section 1507 and data on "Minute" set in the minute setting section 1508 are transmitted to the MFP 200. When a cancel button 1510 is selected to be depressed, the timer setting is canceled.

How to start the MFP 200 ten minutes later will now be concretely described. FIG. 14 is a view showing a window screen displayed when time is set in the minute setting section 1508. When a "▼" button in the minute setting section 1508 is selected, preset times are indicated as a menu. If a desired time is found in the menu, it is selected. On the other hand, if no desired time is found in the menu, a desired time is input to the minute setting section 1508 from a keyboard. Here, a desired time can be found from the menu, and hence "ten minutes" is selected from the menu. Upon selection of the desired time, the characters representative of the desired time are highlighted, and the radio button 1506 is automatically selected. FIG. 15 is a view showing a window screen displayed when a desired time is selected from the menu.

Then, when the execution button 1509 is depressed,

the MFP 200 is instructed to start operation ten
minutes later set by the timer, and the operative
status of the MFP 200 is displayed. FIG. 16 is a view
showing a screen displayed when the execution button

5   1509 appearing in FIG. 15 is depressed. On this
occasion, the time at which the MFP starts operation
may be counted down in the user's terminal apparatus
(personal computer) or in the MFP 200. When counting
is started, a starting time period required to start

10   the MFP 200 is displayed and counted down in a status
display section 1804. As the need arises, to correct
for the starting time period varying with the
environment where the MFP 200 is installed, the
starting time period is updated at predetermined time

15   intervals, and the updated starting time period is
displayed. When the devices have been completely
started, it is indicated that the devices have been
started. FIG. 17 is a view showing a window screen
displayed when the devices have been completely started.

20   In FIG. 17, messages indicating that the devices have
been started are displayed as designated by reference
numeral 1901, and a message "Started" is displayed in a
status display section 1902.

     In setting the starting time period, it is

25   impossible to set a longer period of time than the
minimum period of time required for the main body of
MFP 200 to sleep. If the user forcibly sets a longer

period of time than the minimum period of time, the
period of time set by the user is counted down while it
is reset to the minimum period of time and displayed in
the status display section 1902.

5   As described above, according to the present
embodiment, since the turning-on/off of power supply
and the setting/release of the sleep state are
controlled and the status thereof is displayed via a
network and more particularly on the Web, the user can

10   control the MFP even at a remote location. As a result,
the devices can be kept off or in the sleep state for a
period of time for power supply is not required, and
this contributes to energy-saving. Further, by setting
the starting time period by a timer to cause the

15   devices or the MFP 200 to start at a desired time, the
user does not have to waste time by standing in front
of the MFP until the MFP is started. This is
particularly advantageous in the case where the MFP is
installed in a large office and at a location remote

20   from the user or on a floor other than the floor where
the user is working.

        Although in the above described embodiment, it is
assumed that the timer is set to start the MFP ten
minutes later, this is not limitative, but it is

25   possible to set the timer to start the MFP at a
predetermined time. Further, although in the above
described embodiment, it is assumed that the devices of

the MFP 200, which are sleeping, are started, the devices of the MFP 200, which are powered-off, may be started in a manner similar to that described above. Further, although in the above described embodiment,

5 the MFP performs digital processing, an MFP which performs analog processing may be controlled in a manner similar to that described above insofar as it is equipped with a device controller having a network interface.

10 Further, although in the above described embodiment, the timer is set to start the powered-off or sleeping MFP, but the timer may be set to power on the MFP in a shut-down state.

A description will now be given of a third

15 embodiment of the present invention with reference to FIGS. 18 to 25.

The third embodiment is applied to a remote control system which is capable of performing on/off control of power supply, and timer setting for

20 setting/release of the sleep state. The arrangement of the remote control system is identical with that of the above described first embodiment, and hence description thereof is omitted. Also, parts and elements corresponding to those of the above described first

25 embodiment are designated by identical reference numerals, and hence description thereof is omitted.

FIG. 18 is a view showing a window screen

displayed for changing the display mode.

When the specification setting button 407 in FIG. 18 is selected, a menu of basic setting, network setting, and so forth is displayed. When display

5   setting 1801 is selected from the menu, a device display button 1802 and a function display button 1803 are displayed. FIG. 18 shows a window screen displayed when the device display button 1802 is selected. In the example of FIG. 18, the device display button 1802

10 is selected. Here, the selected device display button 1802 is bold-faced, but may be indicated in colored characters or may be highlighted.

Then, when the function display button 1803 is selected, it becomes bold-faced, and the statuses of

15 the respective functions are displayed as shown in FIG. 19. On this occasion, the device button 403 in FIG. 18 is changed to a function button 1901, and characters indicative of the devices on the window screen are also changed to characters indicative of the functions. In

20 the present embodiment, it is possible to perform power supply control such as turning-on/off of power supply to the devices or causing the devices to sleep by giving instructions directly to the devices, in a manner similar to that described in the above described

25 first or second embodiment. Further, in the present embodiment, it is possible to change the mode to a mode in which the devices are indirectly instructed by

specifying functions using a screen in FIG. 19 to 24, to perform power supply control for respective functions.

FIG. 20 is a view showing a window screen for controlling power supply for respective functions.

When the function button 1901 is selected, a printing function button 2002, a scanning function button 2002, a facsimile function button 2003, a copying function button 2004, and power supply control types 2005 are displayed. The statuses of the respective functions are displayed on the window screen. The statuses may include not only the status of power but also error information and information indicative of residual amounts of supplies such as sheets/toners so that various information indicative of statuses can be sent from the MFP 200 to the terminal apparatus via the LAN 121. The power supply control types 2005 include control setting items such as turning-off of power, turning-on of power, sleep state, release of sleep state, and timer setting.

FIG. 25 is a flow chart showing the procedure of a power supply control process carried out by the MFP 200 as a Web server. It should be noted that respective steps in the FIG. 25 flow chart are executed by the CPU 207 in accordance with a program stored in the memory 205 or the hard disk 206.

First, in the case where the user wants to use the

printing function, if a message "Not ready to print" is displayed on a window screen of the terminal apparatus, the user selects the turning-on of power from among the power supply control types 2005, and at the same time

5   selects the printing function button 2001. When an instruction to select the printing function button 2001 in FIG. 20 is input to the terminal apparatus, the terminal apparatus (the personal computer 112 in FIG. 1) sends a command indicative of the input instruction

10 to the MFP 200 via the LAN 121 (step S6).

In the following description, it is assumed that power supply to the MFP 200 is turned on (started), but in the case where the turning-off of power or the sleep state is selected from among the power supply control

15 types 2005, a power supply control instruction including information on the designated type of power supply control and information on the designated function of the MFP 200 is transmitted from the terminal apparatus to the MFP 200 as in the case where

20 the turning-on of power supply is selected. In the MFP 200 having received the power supply control instruction, power supply is controlled based on the information indicative of the type (2005) of power supply control and the information indicative of the

25 function (one of the types 2001 to 2004) included in the power supply control instruction.

FIG. 21 is a view showing a window screen

displayed when an instruction is given for power supply for the printing function. As shown in FIG. 21, the selected printing function button 2001 is bold-faced, and in a status display section 2104, a period of time

5　required to activate the printing function is displayed and counted down.

On this occasion, the CPU 207 recognizes the information indicative of the type and function of power supply control instructed to be carried out

10　(steps S7 to S9) to designate the type and function of power supply control (steps S15 and S10). Then, the CPU 207 instructs the power supply section 210 to control power supply in accordance with the designated type and function of power supply control (step S11).

15　In this case, each device required for printing is powered on (energized) (step S7 ("YES"), S15, and S11).

Since the printing function is designated here, the printer 203, device controller 204, memory 205, and hard disk 206, which are required for printing, are

20　energized. On the other hand, devices such as the scanner 202, operating section 201, and facsimile section 209, which are not required for printing, are not energized.

Then, the CPU 207 determines whether the power

25　statuses of the devices have changed or not (step S12). In this case, it is determined whether the devices required for printing have come into a standby state or

not. This determination is made by the determining

whether, for example, a predetermined period of time

(i.e. a period of time required to bring the devices

into the standby state) has elapsed or not after the

5   power supply section 210 is instructed to supply power.

When the devices required for printing have come

into the standby state, the MFP 200 generates

information indicating that the devices required for

the printing function designated from the terminal

10 apparatus have come into the standby state (step S13),

and sends the generated information to the terminal

apparatus (step S14).

Then, upon receipt of the communication

information from the MFP 200, the terminal apparatus

15 displays a message "Ready to print" in a status display

section 2204 as shown in FIG. 22.

Although in the above described steps S12 to S14,

when the devices have come into the standby state,

information to this effect is sent to the terminal

20 apparatus, this is not limitative, but it may be

configured such that out of a plurality of types of

changes, a type of change in power status is detected

by the CPU 207 (step S12), a markup language is

generated based on the detected type of change in power

25 status (step S13), and information indicative of the

generated language is sent to the terminal apparatus

(step S14). Further, the message "Ready to print" may

be displayed not only on the screen of the terminal apparatus but also on the operating section 201 of the MFP 200.

In this way, the power statuses of the respective functions of the MFP 200 are displayed on the screen of the terminal apparatus and the operating section 201 of the MFP 200 according to the user's selected types and functions of power supply control, so that the user can know whether his/her desired function can be executed or not. It should be noted that in the case where a function other than the printing function is selected, the same process (steps S12 to S14) is carried out.

Further, when the user wants to make a copy, the copying function button 2004 of the function button 1901 is selected. When an instruction for selecting the copying function button 2004 in FIG. 23 is input to the terminal apparatus, the terminal apparatus (the personal computer 112 in FIG. 1) transmits a command indicative of the instruction to the MFP 200 via the LAN 121.

Then, it is determined whether a power supply control instruction is input from the terminal apparatus or not (step S6), and if the power supply control instruction is input from the terminal apparatus, the CPU 207 determines the input type and function of power supply control instructed to be carried out (steps S7 to S10), and starts the devices

required for copying such that they automatically come into the standby state (step S8 ("YES"), S15, and S11). Since the copying function is designated here, the operating section 201, scanner 202, printer 203, device

5   controller 204, memory 205, and hard disk 206, which are required for copying, are energized. On the other hand, devices such as the facsimile 209, which are not required for printing, are not energized.

At the same time, as shown in FIG. 23, the

10   selected copying button 2004 is bold-faced, and in a status display section 2304, a period of time required to activate to activate the printing function is displayed and counted down.

When the devices required for the copying function

15   designated from the terminal apparatus have come into the standby state ("YES" to the step S12), the CPU 207 generates information indicating that the devices required for the copying function designated from the terminal apparatus have come into the standby state

20   (step S13), and sends the generated information to the terminal apparatus (step S14). When the devices required for the copying function have been powered on, a message "Ready to print" is displayed in a status display section 2404 as shown in FIG. 24. Since the

25   copying function is realized by a combination of the scanning function and the printing function, it is indicated that both the scanning function and the

printing function can be used.

As described above, according to the present embodiment, since the activation of functions is controlled and the statuses thereof are displayed via a network and more particularly on the Web, the user can control the MFP not only in the Intranet environment but also at a remote location. As a result, the devices can be kept off or in the sleep state for a period of time for which power supply is not required, and this contributes to energy-saving. Further, since copying or the like can be performed according to the operative status of the MFP with reference to a period of time displayed on the Web, the user does not have to waste time by standing in front of the MFP until the MFP is started. This is particularly advantageous in the case where the MFP is installed in a large office and at a location remote from the user or on a floor other than the floor where the user is working. Further, since the functions are displayed and controlled independently of each other, the user can supply power only for his/her desired function without hesitation and does not have to carry out such a complicated operation in which devices corresponding to the his/her desired function are determined by the user himself/herself, designated and brought into the ON/OFF/sleep state.

Although in the present embodiment, it is assumed

that the MFP has the printing function, scanning
function, facsimile function, and copying function,
this is not limitative; but the MFP may have a variety
of functions such as a box job function of storing
5 print data in the hard disk of the MFP through the
terminal apparatus.

A description will now be given of a fourth
embodiment of the present invention.

In the fourth embodiment, instructions for
10 controlling power supply are given from the terminal
apparatus (client) capable of communicating with the
MFP 200 via the LAN 121, but the window screens shown
in FIGS. 5 to 24 may be displayed on the operating
section 201 (display operating section) of the main
15 body of the MFP 200 so that instructions for
controlling power supply can be given from the
operating section 201 of the main body of the MFP 200.
The window screens are changed in the same manner as
described with reference to FIGS. 5 to 24.

20 In this way, according to the present embodiment,
the user can control power supply for devices required
for his/her desired function by operating the operating
section 201 of the MFP 200.

It should be noted that as the power supply
25 control, various kinds of power supply control are
assumed such as turning-on/off of power supply and
setting/release of the sleep state as shown in FIG. 7

and other figures, and as the sleep state, for example, sleep states of multiple levels such as a deep mode (in which power consumption is very low, but it takes a long time for the MFP to return to the standby state)

5 and a shallow mode (in which power consumption is high, but it takes only a short time for the MFP to return to the standby state) are provided and displayed on a window screen to provide a more detailed power supply control environment for the user. Thus, the fourth

10 embodiment enables power supply control according to the first through third embodiments to be applied not only to a system composed of terminal apparatuses and the MFP 200 but also to a single image processing apparatus. Further, the processes carried out by the

15 terminal apparatus and the MFP 200 according to the above described first through fourth embodiments may be realized by carrying out communication between the terminal apparatus and the MFP 200 via the server (109 or 100).

20   It should be understood that the present invention is not limited to the embodiments described above, but various variations of the above described embodiments may be possible without departing from the spirits of the present invention.

25   Further, the present invention may either be applied to a single apparatus or to a system composed of a plurality of apparatuses (for example, a host

computer, an interface, a reader, and a printer).

It is to be understood that the object of the present invention may also be accomplished by supplying a system or an apparatus with a storage medium in which

5 a program code of software, as shown in FIGS. 4 and 25 which realizes the functions of any of the embodiments described above is stored, and causing a computer (or CPU or MPU) of the system or apparatus to read out and execute the program code stored in the storage medium.

10 In this case, the program code itself read from the storage medium realizes the functions of any of the embodiments described above, and hence the storage medium on which the program code is stored constitutes the present invention.

15 Further, it is to be understood that the functions of any of the embodiments described above may be accomplished not only by executing a program code read out by a computer, but also by causing an OS (operating system) or the like which operates on the computer to

20 perform a part or all of the actual operations based on instructions of the program code.

Further, it is to be understood that the functions of any of the embodiments described above may be accomplished by writing a program code read out from

25 the storage medium into a memory provided on an expansion board inserted into a computer or in an expansion unit connected to the computer and then

causing a CPU or the like provided in the expansion board or the expansion unit to perform a part or all of the actual operations based on instructions of the program code.

5   In addition, as long as the functions of the above-mentioned embodiments are realized on a computer, the form of the program may be an object code, a program executed by an interpreter, or a script data supplied for an OS.

10   Examples of the storage medium for supplying the program code include a floppy (registered trademark) disk, a hard disk, an optical disk, a magnetic-optical disk, a CD-ROM, a CD-R, a CD-RW, DVD-ROM, a DVD-RAM, a DVD-RW, a DVD+RW, a magnetic tape, a nonvolatile memory

15   card, and a ROM. Alternatively, the program may be downloaded from another computer or a database, not shown, connected to a network such as the Internet, a commercial network, or a local area network.